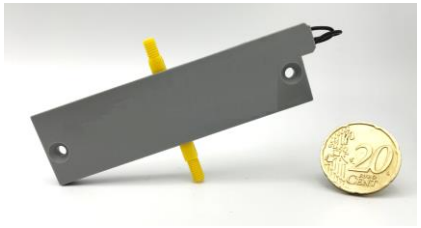
Miniature shape memory actuator (SMA)

Reference: TD-DE-1063

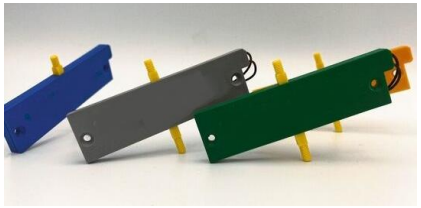
TECHNOLOGY DESCRIPTION

The miniature actuator is based on so-called shape memory actuators (SMA). SMA rely on materials that exhibit a unique behaviour, e.g. nickel-titanium alloys. After being deformed, SMA can "remember" the original undeformed shape. This is firmly imprinted in advance through an annealing process of the actuator. The thermal effect is characterised by the fact that a functionally graded (FG) wire is deformed when cold. This deformation is maintained until the wire is heated above a certain switching temperature, after which it returns to its original shape. In doing so, the wire generates mechanical work. SMA can replace an electromagnet though locking and unlocking systems.



INNOVATIVE ASPECTS

- Simple design and noise-free operation
- Weight and installation space savings (flat design)
- Built-in overload/overheating protection
- Electromagnetically harmless (no magnetic fields, no permanent magnet)
- Nominal stroke of up to 4.5 mm
- Max. force ranges: 4 N to 15 N
- Temperature range: -20°C to +70°C



TECHNOLOGY READINESS (in space application)

TRL 9 (2024)

COUNTRY OF ORIGIN

Germany

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TAGS #shape memory #micro actuator #magnet-free #noise-free #simple design #electrom. safe

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